CLAIMS

1. A computer program product, tangibly stored on machine readable medium, for blending a first graphic element and a second graphic element in accordance with a transfer mode, each element having a color value and an alpha, the product comprising instructions to:

calculate a resulting alpha according to a first continuous function that linearly interpolates between the first element alpha and the second element alpha as a first parameter varies between 0 and 1, inclusive;

calculate a second parameter, the second parameter being a ratio of the smaller of the first and second graphic element alphas and the resulting alpha;

calculate an intermediate color value in accordance with the transfer mode, the color value of the first graphic element, the color value of the second graphic element, and the first parameter; and

calculate a resulting color value according to a second continuous function that interpolates, as the second parameter varies between 0 and 1, inclusive, between the color of the element that has the greater alpha and the intermediate color.

2. The product of claim 1, wherein:

the transfer mode yields a result obtained by blending the color value of the first graphic element with the color value of the second graphic element when the first parameter is 1;

the transfer mode yields the first graphic element color when the first parameter is 0; and

the transfer mode is a continuous function when the first parameter is between 1 and 0, inclusive.

3. The product of claim 2, wherein:

the instructions for calculating intermediate color is used for when the transfer mode is a normal transfer mode and for when the transfer mode is a non-normal transfer mode.

4. The product of claim 3, wherein:

the second function is a color interpolation function.

5. The product of claim 1, wherein the following conditions are satisfied when the first and second graphic element alphas are different:

when the transfer mode is normal and the first parameter is 1, the resulting color and alpha are the color and alpha, respectively, of the second graphic element;

when the first parameter is 0, the resulting color and alpha are the color and alpha, respectively, of the first graphic element;

when the transfer mode is normal, the resulting color and alpha are the same as a color and alpha, respectively, that are derivable by applying a crossfade function;

the resulting alpha is not affected by the transfer mode;

as the first and second graphic element alphas approach equality, the resulting color approaches a color derivable by applying the transfer mode; and

when the alphas and the first parameter vary continuously, the resulting color and alpha also vary continuously.

6. The product of claim 1, wherein:

the instructions for calculating the resulting alpha and the resulting color are not designated for use with a particular transfer mode.

7. The product of claim 1, wherein:

the first graphic element is a lower layer in a composition and the second graphic element is an upper layer in the composition.

8. The product of claim 1, wherein the second graphic element is a filtered version of the first graphic element, the product further comprising instructions to:

filter the first element in accordance with a filter layer to produce the second element.

9. The product of claim 1, wherein the first element is an accumulation layer and the second element is a filtered version of the accumulation layer, the product further comprising instructions to:

receive input specifying a filter; and

apply the filter to the accumulation layer to produce the second element.

10. The product of claim 1, wherein:

each of the first and the second graphic elements is a pixel.

11. The product of claim 1, wherein:

each of the first and the second graphic elements is a region.

12. The product of claim 11, wherein the color and alpha of each region vary with position in the region, the product further comprising instructions to:

calculate a resulting color according to a function that is continuous where the alphas and the color of each region are continuous.

13. The product of claim 1, further comprising instructions to:

receive from a user input a definition of the transfer mode.

14. A computer implemented method for blending a first graphic element and a second graphic element in accordance with a transfer mode T, the first graphic element having a color A and an alpha *a*, the second graphic element having a color B and an alpha *b*, the method comprising:

calculating a resulting alpha as lerp(a, b, *q*), lerp being a linear interpolation function and *q* being a pseudo-opacity that varies between 1 and 0, inclusive;

calculating a blended color as T(A, B, *q*);

calculating an intermediate color as interpolate_color(A, blended color, min(*b*/resulting alpha, 1)), interpolate_color being a continuous function that interpolates its input colors and min being a function that selects the smaller of its input values; and

calculating a result color as interpolate_color(B, intermediate color, min(*a*/resulting

alpha, 1)).

15. The method of claim 14, wherein the colors and the alphas vary spatially, the method further comprising:

calculating a result color in accordance with a function that is continuous where the alphas and the colors are continuous.

16. The method of claim 14, wherein:

calculating a resulting alpha and a result color includes calculating a resulting alpha and a result color when each of the first and the second elements has an alpha that is between fully transparent and fully opaque, exclusive.

17. The method of claim 14, further comprising:

receiving a user input that specifies a non-normal transfer mode.

18. The method of claim 14, wherein the second graphic element is a filtered version of the first graphic element, the method further comprising:

filtering the first element in accordance with a filter layer to produce the second element.

19. The method of claim 14, wherein the first element is an accumulation layer and the second element is a filtered version of the accumulation layer, the product further comprising instructions to:

receiving input specifying a filter; and

applying the filter to the accumulation layer to produce the second element.

20. The method of claim 14, further comprising satisfying the following conditions when the alphas are different:

when the transfer mode is normal and the first parameter is 1, the resulting color and alpha are the color and alpha, respectively, of the second graphic element;

when the first parameter is 0, the resulting color and alpha are the color and alpha, respectively, of the first graphic element;

when the transfer mode is normal, the resulting color and alpha are the same as a color and alpha, respectively, that are derived by applying a crossfade function;

the resulting alpha is not affected by the transfer mode;

when the first and second graphic element alphas approach equality, the resulting color approaches a color derived by applying the transfer mode; and

when the alphas and the first parameter vary continuously, the resulting color and alpha also vary continuously.

21. A computer program product, tangibly stored on machine readable medium, for blending an upper graphic element and a lower graphic element in accordance with a transfer mode, each element having a color value and an alpha, the product comprising instructions to:

define a resulting alpha to be the upper graphic element alpha;

calculate a first parameter, the first parameter being a ratio of the smaller of the upper and lower graphic element alphas and the resulting alpha;

calculate a blended color according to the transfer mode;

define a temporary color value to be:

the lower color when the upper alpha is less than the lower alpha,

the upper color when the lower alpha is less than the upper alpha; and

calculate a resulting color value according to a continuous function that interpolates, as the first parameter varies between 0 and 1, inclusive, between the temporary color and the blended color.

22. The product of claim 21. wherein the instructions to define the temporary color include:

instructions to define the temporary color to be a color when the upper alpha is equal

to the lower alpha.

23. The product of claim 21, wherein:

the instructions for calculating blended color is used for when the transfer mode is a normal transfer mode and for when the transfer mode is a non-normal transfer mode.

24. The product of claim 23, wherein:

the continuous function is a color interpolation function.

25. The product of claim 21, wherein the following conditions are satisfied when the first and second graphic element alphas are different:

when the transfer mode is normal, the resulting color and alpha are the color and alpha, respectively, of the second graphic element;

the resulting alpha is not affected by the transfer mode;

as the first and second graphic element alphas approach equality, the resulting color approaches a color derivable by applying the transfer mode; and

when the alphas vary continuously, the resulting color and alpha also vary continuously.

26. The product of claim 21, wherein:

the instructions for calculating the resulting alpha and the resulting color are not designated for use with a particular transfer mode.

27. The product of claim 21, wherein:

the first graphic element is a lower layer in a composition and the second graphic element is an upper layer in the composition.

28. The product of claim 21, wherein the second graphic element is a filtered version of the first graphic element, the product further comprising instructions to:

filter the first element in accordance with a filter layer to produce the second element.

29. The product of claim 21, wherein the first element is an accumulation layer and the second element is a filtered version of the accumulation layer, the product further comprising instructions to:

receive input specifying a filter; and

apply the filter to the accumulation layer to produce the second element.

30. The product of claim 21, wherein:

each of the first and the second graphic elements is a pixel.

31. The product of claim 21, wherein:

each of the first and the second graphic elements is a region.

32. The product of claim 31, wherein the color and alpha of each region vary with position in the region, the product further comprising instructions to:

calculate a resulting color according to a function that is continuous where the alphas and the color of each region are continuous.

33. The product of claim 21, further comprising instructions to:

receive from a user input a definition of the transfer mode.